CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. (Original) An analytical circuit for an inductive sensor, in particular for a sensor for sensing the rotational behavior of the crankshaft of a motor vehicle internal combustion engine, comprising:

- an electromagnetic sensor with external excitation by means of a constant current,
- a transconductance amplifier to whose inverting input the output signal of the sensor is fed, and whose output signal is converted in an inverting low-pass filter into a reference voltage which is supplied to the non-inverting input of the transconductance amplifier,
- a digitizing circuit comprising a Schmitt trigger and, in parallel with it, a voltage comparator, to both of which the output signal of the transconductance amplifier and the reference voltage are supplied, and whereby the Schmitt trigger outputs a hysteresis-affected output signal and the voltage comparator outputs a hysteresis-free output signal, and
- a logic circuit which forms a hysteresis-free output signal of the analytical circuit from the two output signals of the digitizing circuit and makes it available for further processing.

2. (Original) The analytical circuit according to claim 1, wherein

- the logic circuit has two inverters and four NAND gates,
- the input of the inverter and one input of the NAND gate are connected to the output of the Schmitt trigger,
- the input of the inverter and the other input of the NAND gate are connected to the output of the voltage comparator,
- the output of the inverter is connected to one input of the NAND gate, and the output of the inverter is connected to the other input of the inverter,
- the output of the NAND gate is connected to an input of the NAND gate and the output of the NAND gate is connected to an input of the NAND gate, and
- the two NAND gates form a transparent RS flip-flop, whereby the output of the NAND gate is connected to the other input of the NAND gate and the output of the NAND gate at which the output signal of the sensor system can be tapped for further processing is connected to the other input of the NAND gate.

3. (Currently Amended) The analytical circuit according to claim 1, wherein

- an upper, a middle and a lower voltage threshold are predefined **in a diagnostic circuit receiving said reference voltage**,
- a line break is detected when the reference voltage exceeds the middle voltage threshold,
- a short circuit to battery voltage potential is detected when the reference voltage exceeds the upper voltage threshold, and
- a short circuit to reference voltage potential is detected when the reference voltage exceeds the lower voltage threshold.

4. (Original) The analytical circuit according to claim 3, wherein

- a voltage divider located between a supply voltage and reference voltage potential is provided for forming the upper, middle and lower voltage threshold,
- a voltage comparator is provided in which the reference voltage is compared with the upper voltage threshold,
- a voltage comparator is provided in which the reference voltage is compared with the middle voltage threshold,
- a voltage comparator is provided in which the reference voltage is compared with the lower voltage threshold, and
- the levels of the output signals of the voltage comparators which are low when the reference voltage does not exceed the middle and upper voltage threshold or does not fall below the lower voltage threshold are stored in a holding circuit from which they can be retrieved for further processing and can be cleared by means of a reset signal.

5. (Original) A method for sensing the rotational behavior of the crankshaft of a motor vehicle internal combustion engine, using an analytical circuit for an inductive sensor, comprising the steps of:

- providing an electromagnetic sensor signal with external excitation by means of a constant current,
- feeding the sensor signal to an inverting input of a transconductance amplifier,
- converting an output signal of the transconductance amplifier in an inverting low-pass filter into a reference voltage which is supplied to the non-inverting input of the transconductance amplifier,
- supplying the output signal of the transconductance amplifier and the reference voltage to a digitizing circuit comprising a Schmitt trigger and, in parallel to a voltage comparator, and whereby the Schmitt trigger outputs a hysteresis-affected output signal and the voltage comparator outputs a hysteresis-free output signal, and
- forming a hysteresis-free output signal of the analytical circuit from the two output signals of the digitizing circuit and making it available for further processing.

6. (Original) The method according to claim 5, wherein

- an upper, a middle and a lower voltage threshold are predefined,
- a line break is detected when the reference voltage exceeds the middle voltage threshold,
- a short circuit to battery voltage potential is detected when the reference voltage exceeds the upper voltage threshold, and
- a short circuit to reference voltage potential is detected when the reference voltage exceeds the lower voltage threshold.

7. (Original) The method according to claim 6, comprising the steps of:

- forming the upper, middle and lower voltage threshold by a voltage divider located between a supply voltage and reference voltage potential,
- comparing the reference voltage with the upper voltage threshold,
- comparing the reference voltage with the middle voltage threshold,
- comparing the reference voltage with the lower voltage threshold, and

storing the results of the comparison when the reference voltage does not exceed the middle and upper voltage threshold or does not fall below the lower voltage threshold for further processing.

8. (Original) The method according to claim 7, wherein reset means are provided for resetting the comparison results.

9. (Original) The method according to claim 7, wherein storage means are provided for storing the comparison results.